

WOOD WARBLERS WINTERING IN CUBA

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LITTLE is known concerning the winter behavior of the various species of North American wood warblers (Parulidae) which retire south of the United States in the fall. Are they sedentary or do they wander over broad geographic areas? What degree of sociality among individuals and species is present? Because of the abundance of warblers in Cuba during the winter this island is an ideal place to study these questions.

From December 23, 1948 to January 3, 1949 I was on the island of Cuba with Ernest P. Edwards and George E. Grube. We stayed at the Harvard University Tropical Station which is approximately ten kilometers northeast of Cienfuegos. Habitats typical of this locality were well described by Barbour (1922:16-17).

Much of the land in this area has been cleared of its native vegetation to make way for sugar cane and pasture. The areas still forested are located on limestone outcrops, along fresh and brackish water streams, and along fence rows. Because of the abundance of termites, fences are of live trees, principally *Bursura* sp. and *Gliricidia* sp. The winter fruits of these trees and their insect fauna attract many birds.

My primary objective was to study the winter habits of the Ovenbird (*Seiurus aurocapillus*), Northern Water-thrush (*Seiurus noveboracensis*), and Louisiana Water-thrush (*Seiurus motacilla*). Three areas of habitat typical for these birds were chosen for study. The Ovenbird was found in upland woods; the Northern Water-thrush in and adjacent to mangroves; and the Louisiana Water-thrush along wooded fresh-water streams. Notes were taken on all parulids as well as on other species. For the most part the wood warblers present in the region were species which also winter in extreme southern Florida and throughout the Greater and Lesser Antilles.

INDIVIDUAL AND SPECIFIC SOCIALITY

The warblers were found (1) singly, (2) in flocks of one species, or (3) in flocks of several species. Species tending to be solitary (category 1) were the Louisiana Water-thrush, Ovenbird, Northern Water-thrush, Swainson's Warbler (*Limnothlypis swainsonii*), and Cape May Warbler (*Dendroica tigrina*). The Ovenbird and Northern Water-thrush were sometimes seen near mixed flocks of other species but were usually encountered as single individuals. All of these are primarily terrestrial or semiaquatic feeders except the Cape May Warbler which was usually seen feeding singly about bromeliads or trees in flower. In the second category was the Palm Warbler (*Dendroica palmarum*). Flocks numbering up to ten individuals, usually feeding in open fields, were seen on several occasions. However, they were also found in other

TABLE 1
MINED FLOCKS OF WARBLERS IN CUBA

	Mangroves			Upland Woods					Wooded Stream Border					
	Flock Number													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Black and White Warbler	1		1	1	1	1	2	1	1			1		
2. Parula Warbler.....	5	3	1	1	1	1		3		1	1			
3. Black-throated Blue Warbler					1	1	1		1	1	1	1	1	1
4. Prairie Warbler.....	1					1		1			1			1
5. Redstart	4	3	2	2	2	3	3	4		1	1	1	1	1
6. Tody	1	1	1	1	1									
7. Loggerhead Flycatcher	1					1	1							
8. Greater Antillean Pewee			2	1	1	3	2							
9. Cuban Vireo							2							
10. Yellow-throated Vireo						1	1							
11. Palm Warbler			1						1	1	1	1		
12. Ovenbird	1			1	1	2	2	1						
13. Northern Water-thrush	2	1												
Total individuals per flock	13	11	8	4	8	14	14	10						

Species 1 through 5 are considered "nucleus species" and 6 through 13 "circumference species." Circumference species in the wooded stream border were not recorded in my field notes.

types of habitat and were sometimes seen singly. They were seldom found in mixed species flocks. The Yellow-throat (*Geothlypis trichas*) was often seen in loose aggregations but never in relatively compact flocks as was the Palm Warbler which fed in open fields and at the borders of fields. Flocks of several species (category 3) usually included the Black and White Warbler (*Mniotilta varia*), Parula Warbler (*Parula americana*), Black-throated Blue Warbler (*Dendroica caerulescens*), Prairie Warbler (*Dendroica discolor*), and the Redstart (*Setophaga ruticilla*). These aggregations were encountered in all three study areas (see Table 1). The mixed species flocks of winter birds, familiar in the northern United States, variously composed of chickadees, nuthatches, woodpeckers, kinglets, and brown creepers, seemed to be paralleled here by these wintering warblers. The groups moved gradually through the woods, each species of the flock feeding in its own fashion within fairly consistent altitudinal limits. Black and White Warblers searched for food hidden in the tree trunks; Parula, Yellow-throated, and Prairie Warblers hunted the tops and central areas of the trees; Black-throated Blue Warblers fed mainly close to the ground; and Redstarts fluttered from ground to tree-top after flying insects. Indigenous species sometimes associated with these flocks, particularly in the upland woods, were the Cuban Tody (*Todus multicolor*), Loggerhead Flycatcher (*Tolmarchus caudifasciatus*), Greater Antillean Pewee (*Contopus caribaeus*), and the Cuban Vireo (*Vireo gundlachii*).

On three occasions I heard excited chipping from some or all of the species in these flocks which seemed to indicate they were in close communication with one another. Two of these incidents occurred after I shot a member of such a group. A third seemed to start spontaneously, all members of the mixed group beginning to chip excitedly. The cause of the excitement was never discovered. I looked hard for a Cuban Pygmy Owl (*Glaucidium siju*), known to occur locally, or some other predator but never succeeded in locating one.

TERRITORIALITY

Most of the solitary warblers seemed to remain within rather well circumscribed areas. An Ovenbird, assumed to be the same individual, could always be found in an open greenhouse within the confines of the Tropical Station. However, none of the warblers studied, except the Louisiana Water-thrush showed obvious territorial tendencies. This species appeared to be established in distinct feeding areas along fresh water streams. Ten individuals occurred over a distance of about one kilometer along a stream. On three occasions I visited this area and each time Louisiana Water-thrushes were seen in the same locations along the stream. As I walked up the stream one bird would flush from the bank and fly upstream approximately 100 meters in two or three short flights. Then the bird would fly around me downstream or engage

in a fight with another Water-thrush. These fights, of which three were seen, were brief encounters involving a flashing of wings and short aerial chases. Before and during these engagements chipping was loud and frequent and was followed by a "sputtering" sound from one or both of the birds. This behavior pattern suggested somewhat the defense of territory by the male on the breeding grounds (Eaton, 1949). The last day I visited this area I was able to collect five of these birds all of which proved to be males.

MISCELLANEOUS OBSERVATIONS

The Black and White Warbler was the only species of warbler heard singing and was heard only twice during intraspecific fighting. It was interesting to note the presence of vertebrate bones in warbler stomachs. Bones of small amphibians were found in stomachs of the Louisiana Water-thrush and bones of small lizards in stomachs of Swainson's Warbler, Worm-eating Warbler (*Helmitheros vermivorus*), and Ovenbird.

DISCUSSION

The solitary species were more sedentary and restricted in their choice of feeding areas than the species in mixed flocks. The Ovenbird fed on the ground but hopped up into the tree canopy to seek shelter. The Northern Water-thrush fed on the ground and along edges of pools but when disturbed flew into the dense tangles of mangroves. These essentially solitary individuals became loosely associated with mixed flocks only when seeking cover. Louisiana Water-thrushes were never seen with mixed species flocks. They seldom left the stream border. These three species range in weight from 15 to 21 grams in contrast to members of mixed flocks which range from 7 to 11 grams. The Cape May Warbler, the last of the normally solitary warblers here considered, was usually seen near flowers, which at this season were not generally distributed. This fact may explain why the Cape May seldom wanders with mixed flocks.

The Palm Warbler was considered by Todd (1940:534) to be sparrow-like in its haunts and habits, particularly in the fall. Trautman (1940:365) said (Ohio): "The bird habitually flocked by itself in a brushy thicket of less than an acre in extent. . . ." Palmer (1949:483) said it was gregarious and social in the fall and often accompanied other warblers as well as juncos. This gregariousness seemed to be maintained into the winter in Cuba—a unique habit for a member of this family. This inclination of the species to feed in open areas may well account for the single species flock. A parallel may be drawn here to pure flocks of juncos, Tree Sparrows (*Spizella arborea*), and black-birds which feed in open areas during the non-breeding season. Allee (1938) mentions examples from other groups: including the grouping of foreigners

in a strange city, the schooling of fish in a clean aquarium, and the flocking tendency of mammals on the grassy plains of the temperate zones.

Chapin (1932:220–224) wrote of mixed flocks in the Belgian Congo and spoke of their presence there at all seasons. Winterbottom (1949:258) suggested that species of woodland bird parties of Northern Rhodesia fall into two categories: “nucleus” species, always found in parties; and “circumference” species which formed mixed parties by attaching themselves to groups of nucleus species. Davis (1946:tables II and III) classified birds, in mixed flocks in Brazilian forest, as regular or accidental in respect to their membership in the flocks. The mixed flocks of warblers I saw in wooded habitat in Cuba seemed to suggest similar associations. Nucleus species appeared to be the Black and White Warbler, Parula Warbler, Prairie Warbler, Black-throated Blue Warbler, and Redstart. Redstarts and Parula Warblers were represented in flocks by from two to five individuals—other nucleus species usually by one individual. Circumference species included the Ovenbird, Northern Water-thrush (in mangroves), Cuban Tody, Loggerhead Flycatcher, Greater Antillean Pewee, Cuban Vireo, and Yellow-throated Vireo (*Vireo flavifrons*). It must be remembered that my data merely suggest these categories and further work should be done before further generalizations are made.

The sedentary habits of wintering warblers have been previously observed. Wetmore (1943:318) wrote of a Redstart which fed in a very restricted area near his camp in Veracruz. The Louisiana Water-thrushes which I observed in Cuba had feeding territories which averaged 100 meters in length—approximately one quarter the length of the average breeding territory (Eaton, 1949). Another species which frequents the borders of streams shows a similar type of feeding territory. Bent (1948:109), writing of the Dipper (*Cinclus mexicanus*), said that even though the territories are shorter in winter, they seem to be fairly well maintained.

SUMMARY

North American warblers wintering in Cuba are either solitary or occur in flocks of one or several species. Large ground-feeding species and species which habitually feed near flowering plants usually occur as solitary individuals. Species feeding in open fields tend to occur in pure flocks. Mixed aggregations usually consist of small species which feed within canopies of heavily wooded areas. Perhaps these flocks have some survival value. They appear to be counterparts of Winterbottom’s “nucleus” and “circumference” species.

The solitary warblers seemed to be sedentary but the only species seen actively defending a feeding area was the Louisiana Water-thrush.

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